

Abstract of the Disclosure

A metal induced crystallization process is provided which employs an amorphous silicon film precursor deposited by physical vapor deposition, wherein the precursor film does not readily undergo crystallization by partial solid phase crystallization. Using this physical vapor deposition amorphous silicon precursor film, the amorphous silicon film is transformed to polysilicon by metal induced crystallization wherein the crystalline growth occurs fastest at regions that have been augmented with a metal catalyst and proceeds extremely slowly, practically zero, at regions which bear no metal catalyst.

Accordingly, by use of the physical vapor deposition amorphous silicon precursor film in

the process of the present invention, the metal induced crystallization process may take place at higher annealing temperatures and shorter annealing times without solid phase crystallization taking place. The process has a faster throughput than previous metal induced crystallization processes, results in a polysilicon film having virtually no catalyst impurities remaining in the film, and results in a film having uniform material characteristics. The resulting polysilicon film may be utilized in thin film transistors or liquid crystal displays.